

**PP-63**

**Phosphorus solubilizing endophytic bacteria from Indian Himalayas and their role in plant growth promotion**

**Kusam Lata Rana, Divjot Kour, Ajar Nath Yadav\***

Department of Biotechnology, Dr. Khem Singh Gill Akal College of Agriculture, Eternal University, Baru Sahib, Sirmour-173101, India

Endophytes are the hidden companions of the inner plant tissues. These microbes have an ability to undergo various plant growth mechanisms to benefit their host. Looking at the endophytic microbe's benefits, a total of 67 putative endophytic bacteria were isolated using different nutrient growth media from three different maize genotypes grown in the Divine Valley of Baru Sahib, Himachal Pradesh. Out of 67, 10 endophytic bacterial isolates were selected for the further characterization on the basis of plant growth promoting attributes. Phosphorus (P) and potassium (K)-solubilization was observed in about 25% of the bacterial isolates. Additionally, bacterial endophytes ability of undergoing mechanisms like nitrogenase activity, production of indole acetic acids (IAA) and siderophores were also studied. Among 10 selected bacterial strains, the three efficient endophytic plant growth promoting strains EU-A2SK1, EU-M4ARAct and EU-E1RT3-1 were identified as *Pseudomonas brenneri*, *Ewingella americana*, and *Pantoea agglomerans* respectively. The phylogenetic tree was constructed to know the taxonomical affiliations of selected bacterial strains. These three efficient endophytic bacterial strains were tested on the maize seeds. The isolates efficiently increased the shoot length and enhanced anthocyanin, chlorophyll content, physiological available iron, and total protein content as compared to untreated control maize plants at 60 days of maize plant growth. These bacterial strains as single or in the consortium could be useful as bioinoculants/biofertilizers for sustainable agriculture.

**Keywords:** Biochemical levels, Endophytes, Maize, *Pantoea*, Plant growth promotion, Sustainable Agriculture